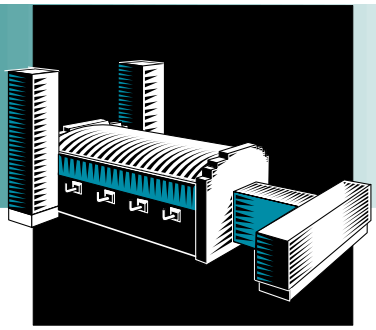
GLASS
Project Fact Sheet



Improved Refractories for Glass

Benefits

- Increased energy efficiency and productivity of furnace operations—the anticipated 100 percent conversion of existing furnaces to oxyfuel firing by 2020 will provide estimated energy savings of 90 trillion Btu
- Increased refractory stability and service life
- Improved product quality

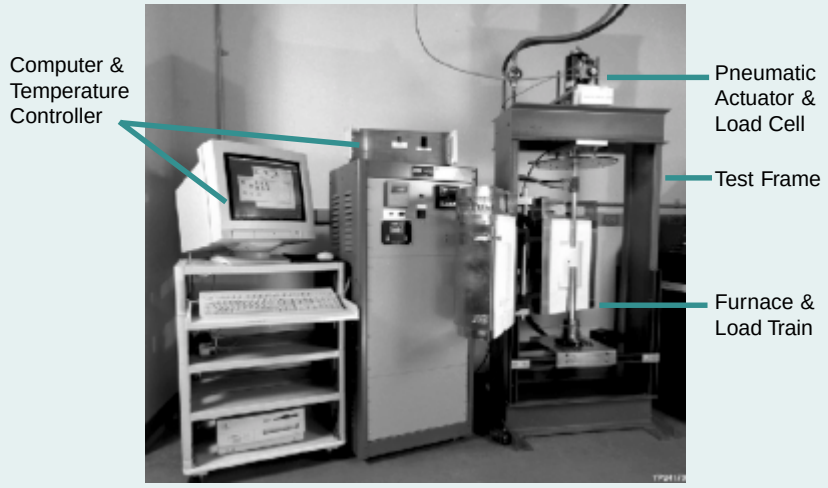
Applications

Accurate refractory data and improved materials will aid the design of new furnaces and conversion of existing ones. Superior refractories will accelerate conversion to oxyfuel firing in all sectors of the glass industry.

Improved refractory materials will help the industry realize the full benefits of oxyfuel firing

More and more furnaces in all four sectors of the glass industry are being converted to oxyfuel firing because of its advantages in energy efficiency, emissions reduction, and productivity. However, traditional refractories in these converted furnaces are exhibiting greater deformation and corrosion due to severe environments and higher operating temperatures, some as high as 3200°F (1760°C). Researchers from Oak Ridge National Laboratory, in cooperation with a host of specialists from the glass manufacturing industry, will test, analyze, and characterize a variety of refractory materials in an effort to develop refractories with superior creep and corrosion resistance. Superior refractories will improve the efficiency, stability, and lifetime of oxyfuel furnaces in all segments of the glass industry.

Creep Testing Facilities



Testing of refractory materials will be performed in high-temperature compression creep testing facilities created specifically for this project.

Project Description

Goal: Characterize the high-temperature performance of existing and alternative refractory materials in order to develop refractories with superior creep and corrosion resistance for industry-wide use.

Researchers are testing and characterizing the following eight refractory materials, identified and prioritized by an industry survey, in test frames capable of accurate measurements up to 1800°C:

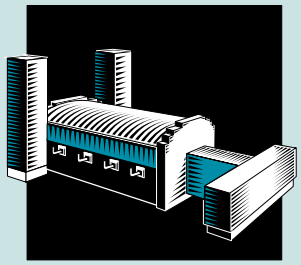
1. Fused-cast alumina
2. Andalusite
3. Bonded AZS (alumina-zirconia-silica)
4. Fused-cast AZS
5. Fused-grain mullite
6. Conventional silica
7. Fused silica
8. Bonded zircon.

Progress and Milestones

The Glass Industry Advisory Committee (GIAC) was formed to provide industry guidance and input to the project. The GIAC is comprised of nine members, all recognized industry leaders in their respective fields, representing vendors, manufacturers, and academia.

A unique survey was conducted in which representatives from 34 domestic manufacturers in all four sectors of the glass industry identified and prioritized the refractory materials that should be tested. The survey represented the first time that competing glass manufacturers united to identify their refractory priorities for the good of the industry.

Two test frames capable of measurements up to 1800°C were constructed in FY97, and testing of the selected refractory materials is underway.



Project Partners

Anchor Glass Container Corp.
Tampa, FL

Center for Glass Research
Alfred, NY

Corning Incorporated
Corning, NY

Ford Motor Co.
Dearborn, MI

Glass Industry Consulting
Laguna Niguel, CA

Oak Ridge National Laboratory
Oak Ridge, TN

PPG Industries
Pittsburgh, PA

Techneglas, Inc.
Columbus, OH

University of Missouri-Rolla
Rolla, MO

For additional information, please contact:

Elliott Levine
Office of Industrial Technologies
Phone: (202) 586-1476
Fax: (202) 586-3180
elliott.levine@ee.doe.gov
http://www.oit.doe.gov/glass

Please send any comments, questions, or suggestions to webmaster.oit@ee.doe.gov

Visit our home page at http://www.oit.doe.gov

Office of Industrial Technologies
Energy Efficiency
and Renewable Energy
U.S. Department of Energy
Washington, D.C. 20585

OIT

December 2000